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| 10/708,576 | 03/12/2004 | Chien-Hua Hsu | MTKP0045USA | 2575 |

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| EXAMINER |
|---|
| LEE, GINA W |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| | Application No. | Applicant(s) |
|---|---|---|
| **Office Action Summary** | 10/708,576 | HSU, CHIEN-HUA |
| | Examiner | Art Unit | |
| | Gina W. Lee | 2609 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☒ Responsive to communication(s) filed on _12 March 2004_.
2a) ☐ This action is **FINAL**.     2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☐ Claim(s) _____ is/are pending in the application.
  4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) _1-22_ is/are rejected.
7) ☒ Claim(s) _7 and 13_ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on _12 March 2004_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  a) ☒ All   b) ☐ Some * c) ☐ None of:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. _____.
    3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
  * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
  Paper No(s)/Mail Date _12 March 2004, 26 April 2004_
4) ☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Priority*

1.      Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers

have been placed of record in the file.

### *Claim Objections*

2.      Claims 7 and 13 are objected to because of the following informality: "bit stream"

should be replaced with "a bit stream". Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

3.      The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

4.      Claims 1-2, 5-8, and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Applicant's Admitted Prior Art in view of Hilpert et al. (US 6,453,282).

5.      With respect to **claims 1, 2, and 15**, the applicant's admitted prior art teaches a method

for coding an input signal to an output signal, the method comprising:

- performing a subband coding process to produce a plurality of subband samples

    according to the input signal, different subband samples corresponding to the input signal

in different time intervals, each of the subband samples having a plurality of frequency

subbands (paragraphs [0005] and [0009])

- performing a transform process to multiply the plurality of frequency subbands by the

  plurality of weighted values of the window determined in the selection process for

  producing a weighted result, and to generate the output signal by a predetermined

  algorithm according to the weighted result (Fig.1, paragraph [0009])

but it does not teach the step of performing a selection process to provide a window

corresponding to a predetermined block length. However, the examiner contends that this

concept was well known in the art, as taught by Hilpert.

In the same field of endeavor, Hilpert teaches the use of selecting the size of the window

based on the energy of the sample data to determine the presence or absence of a transient in the

audio signal (Fig. 1, col. 7, lines 5-10, Transient detection (12) indicates whether a short or long

window is to be specified for the windowing and transform). Hilpert also teaches that if the

energy sum of the frequency subbands of the reference sample data in the predetermined

frequency range is larger than a first threshold value (col. 8, lines 41-50, energy of the signal

must exceed a minimum energy), a further process is executed, comprising:

- dividing the reference sample data into several subsample data (col. 7, lines 39-50, input

  signal is divided into consecutive segments); and

- calculating an energy difference between two adjacent subsample data in the

  predetermined frequency range, if the energy difference is larger than a second threshold

  value, using a window of a short block length in the transform process (col. 8, lines 27-

  50, energy of the present segment is compared with the energy of the segment preceding

the current segment, and supplies the criterion for the energy rise needed to recognize a

transient.).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to modify the applicant's admitted prior art by specifically adding the

transient determination step, as taught by Hilpert, to code audio data more accurately by

performing window switching in order to avoid any "pre-echoes" in the signal (col. 1, lines 36-

56).

6.      With respect to **claim 5**, the applicant's admitted prior art in view of Hilpert teaches

everything claimed, as applied above (see claim 2); furthermore, the applicant's admitted prior

art in view of Hilpert teach that if the energy sum of the frequency subbands of the reference

sample data in the predetermined frequency range is less than the first threshold value, then it is

transformed with a window of a long block length in the transform process (col. 8, lines 41-50,

energy of the signal must exceed a minimum energy to trigger a change to the short window).

7.      With respect to **claim 6**, the applicant's admitted prior art in view of Hilpert teaches

everything claimed, as applied above (see claim 1); in addition, the applicant's admitted prior art

further teaches that the input signal may be a pulse code modulation (PCM) signal (paragraph

[0009]).

8.      With respect to **claim 7**, the applicant's admitted prior art in view of Hilpert teaches
everything claimed, as applied above (see claim 1); in addition, the applicant's admitted prior art
further teaches that the output signal is a bit stream (paragraph [0009]).

9.      With respect to **claim 8**, the applicant's admitted prior art in view of Hilpert teaches
everything claimed, as applied above (see claim 1); in addition, the applicant's admitted prior art
further teaches that the predetermined algorithm is a modified discrete cosine transform (MDCT)
(paragraph [0009]).

10.     With respect to **claim 16**, the applicant's admitted prior art in view of Hilpert teaches
everything claimed, as applied above (see claim 15); furthermore, the applicant's admitted prior
art in view of  Hilpert teach that when determining the transient of the audio signal according to
the energy difference, if the energy difference is larger than a second threshold value, the audio
signal between the two subsample data is the transient (col. 8, lines 27-50, energy of the present
segment is compared with the energy of the segment preceding the current segment, and supplies
the criterion for the energy rise needed to recognize a transient).

11.     Claims 3-4 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the
applicant's admitted prior art in view of Hilpert et al. (US 6,453,282) as applied to claims 2 and
15 above, respectively, and further in view of Davidson et al. (US 5,394,473).

12.     With respect to **claims 3 and 17**, the applicant's admitted prior art in view of Hilpert

teaches everything claimed, as applied above (see claims 2 and 15), but does not teach that

"when performing the first comparing process, if the energy difference of the frequency

subbands between two adjacent subsample data in the predetermined frequency range is less than

or equal to the second threshold value, performing a second comparing process and let the

subsample data in the second comparing process include different subband samples from the

subband samples of the subsample data in the first comparing process." However, the examiner

contends that this concept was well known in the art, as taught by Davidson.

        In the same field of endeavor, Davidson teaches a method of audio coding in which the

energy of adjacent subblocks are compared, and comparison is repeated for the subframes on the

next hierarchical level (Fig. 14-15, col. 23-24).

        Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to modify the applicant's admitted prior art in view of Hilpert to add the step

of further comparison for shorter time resolutions in order to define with greater accuracy the

location of any transients (col. 23-25).


13.     With respect to **claims 4 and 18**, the applicant's admitted prior art in view of Hilpert and

Davidson teach everything claimed, as applied above (see claims 3 and 17); in addition, the

applicant's admitted prior art in view of Hilpert and Davidson teach that when performing the

second comparing process, a different second threshold value is selected (Fig. 13, col. 23-24,

energy difference can be different because the threshold is based on a ratio and not a constant).

14.     Claims 9-10, 12-14, 19-20, and 22 are rejected under 35 U.S.C. 103(a) as being

unpatentable over the applicant's admitted prior art in view of Hilpert et al. (US 6,453,282).


15.     With respect to **claims 9 and 19**, the applicant's admitted prior art teaches an apparatus

for coding an input signal to an output signal, the coding apparatus comprising:

- a polyphase filter bank for producing a plurality of subband samples according to the

   input signal, different subband samples corresponding to the input signal in different time

   intervals, each subband sample having a plurality of frequency subbands (Fig. 1,

   paragraph [0009]); and

- a coding processing unit connected to the polyphase filter bank and the transient detector

   for multiplying the plurality of frequency subbands by the plurality of weighted values of

   the window to generate a weighted result, and generating the output signal by a

   predetermined algorithm according to the weighted result (Fig. 1, paragraph [0009])

but it does not teach the use of a transient detector. However, the examiner contends that this

concept was well known in the art, as taught by Hilpert.

Hilpert teaches an apparatus for coding an audio signal including a transient detector

connected to the polyphase filter bank for determining a block length of a window, the window

including a plurality of weighted values, the transient detector including:

- a subband selector for selecting the plurality of subband samples as reference sample data

   (Fig.2, col. 3, 22-25, signal is filtered so that only a particular frequency grouping is

   considered);

- an energy calculator connected to the subband selector for calculating an energy sum of the frequency subbands of the reference sample data (Fig.2, col. 8, lines 27-30, rise detector (20) calculates the energy of the segment); and

- a partition device connected to the subband selector and the energy calculator for dividing the reference sample data into several subsample data, each subsample data having at least a subband sample (Fig. 2, col. 7, lines 38-50, segmenter (14) divides the input signal into segments, containing some sampled values); and

- a comparator connected to the energy calculator for comparing an output value of the energy calculator with a first threshold value, and outputting a signal representing the block length of the window according to a comparing result (Fig.2, col. 8, lines 27-30, rise detector (20) compares the energy of the segment and the adjacent segments)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the applicant's admitted prior art by adding the transient detector, as taught by Hilpert, in order to improve a known method of audio coding by enabling reliable detection of transients, and thus simple suppression of pre-echoes, in an efficient and simple way (col. 3, lines 45-55).

16.     With respect to **claims 10 and 20**, the applicant's admitted prior art in view of Hilpert teaches everything claimed, as applied above (see claims 9 and 19); furthermore, applicant's admitted prior art in view of Hilpert teach that the energy calculator calculates an energy difference of the frequency subbands of two adjacent subsample data, and delivers a result to the

comparator for comparing the result with a second threshold value (Fig.2, col. 8, lines 27-30, rise detector (20) compares the energy of the segment and the adjacent segments).

17.     With respect to **claims 12 and 22**, the applicant's admitted prior art in view of Hilpert teaches everything claimed, as applied above (see claims 9 and 19); in addition, the applicant's admitted prior art further teaches that the input signal may be a pulse code modulation (PCM) signal (paragraph [0009]).

18.     With respect to **claim 13**, the applicant's admitted prior art in view of Hilpert teaches everything claimed, as applied above (see claim 9); in addition, the applicant's admitted prior art further teaches that the output signal is a bit stream (paragraph [0009]).

19.     With respect to **claim 14**, the applicant's admitted prior art in view of Hilpert teaches everything claimed, as applied above (see claim 9); in addition, the applicant's admitted prior art further teaches that the predetermined algorithm is a modified discrete cosine transform (MDCT) (paragraph [0009]).

20.     Claims 11 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art in view of Hilpert et al. (US 6,453,282) as applied to claims 10 and 20 above, respectively, and further in view of Davidson et al. (US 5,394,473).

21.     With respect to **claims 11 and 21,** the applicant's admitted prior art in view of Hilpert

teaches everything claimed, as applied above (see claims 10 and 20), but does not teach that the

partition device divides the reference sample data into several subsample data according to the

result of the comparator, each subsample data including subband samples different from the

subband samples of the preceding subsample data. However, the examiner contends that this

concept was well known in the art, as taught by Davidson.

In the same field of endeavor, Davidson teaches an apparatus for encoding audio in

which the energy of adjacent subblocks are compared, and comparison is repeated for the

subframes on the next hierarchical level (Fig. 1, col. 23-24).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to modify the applicant's admitted prior art in view of Hilpert to modify the

partition device to further segment the data in order to allow the transient detector to select

higher temporal resolution in the presence of transients in the audio signal (col. 22, lines 4-46).


## *Conclusion*

22.     The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

Manu (US 2004/0088160) discloses a method and apparatus for audio coding using

window switching and transient detection.

Chakravarthy et al. (US 2004/0196913) discloses a method and apparatus for audio

coding using a transient detection module.

Smyth et al. (US 5,956,674) discloses a subband audio coder that employs transient analysis.

Budnikov (US 2003/0215013) discloses a subband audio coder with adaptive short window grouping, using a window length selector based on transient analysis.

Levine (US 6,266,644) discloses an audio encoding apparatus and method that relies on transient detection.

23.     Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gina W. Lee whose telephone number is (571) 270-3139. The examiner can normally be reached on Monday to Thursday, 6:30 AM - 5:00 PM EST.

24.     If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexander Eisen can be reached on (571) 272-2687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
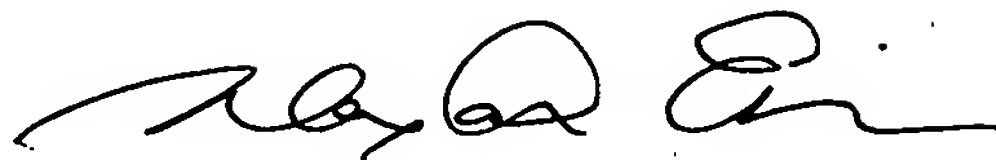
25.     Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alexander Eisen

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